Please read and save these instructions. Read carefully before attempting to assemble, install, operate or maintain the product described. Protect yourself and others by observing all safety information. Failure to comply with instructions could result in personal injury and/or property damage! Retain instructions for future reference.

Dayton® Propane Construction Convection Heater

Description

Dayton Model 3VH22 heater is a 40,000, 60,000, and 80,000 Btu/Hr construction heater. This heater uses propane gas for combustion. It is primarily intended for outdoor use and the temporary heating of well-ventilated buildings under construction, alteration, or repair. This heater should never be used in occupied dwellings. **Products of combustion are vented into the area being heated.**

Unpacking

1. Remove all packing items applied to heater for shipment. Keep plastic cover caps (attached to inlet connector and hose/regulator assembly) for storage.
2. Remove all items from carton.
3. Check all items for shipping damage. If heater is damaged, promptly inform dealer where you purchased heater.



Figure 1 – Model 3VH22



⚠ GENERAL HAZARD WARNING

Failure to comply with the precautions and instructions provided with this heater can result in death, serious bodily injury, and property loss or damage from hazards of fire, explosion, burn, asphyxiation, carbon monoxide poisoning, and/or electrical shock.

Only persons who can understand and follow instructions should use this heater.

If you need assistance or heater information such as an instruction manual, labels, etc. contact the manufacturer.

⚠ WARNING Not for home or recreational vehicle use.

⚠ WARNING Fire, burn, inhalation, and explosion hazard. Keep solid combustibles such as building materials, paper or cardboard, a safe distance away from the heater as recommended by the instructions. Never use the heater in spaces which do or may contain volatile or airborne combustibles, or products such as gasoline, solvents, paint thinner, dust particles, or unknown chemicals.

The heater is designed for use as a construction heater in accordance with ANSI Z83.7/CGA 2.14. Other standards govern the use of fuel gases and heating products for specific uses. Your local authority can advise you about these. The primary purpose of construction heaters is to provide temporary heating of buildings under construction, alteration or repair. Properly used, the heater provides safe economical heating. Products of combustion are vented into the area being heated.

We cannot foresee every use which may be made of our heaters. Check with your local fire safety authority if you have questions about heater use.

Form 5S3931

Printed in U.S.A.
03430
1202/261/VCPVP

Dayton®

Dayton® Propane Construction Convection Heater

General Safety Information

Make certain you read and understand all warnings. Keep these instructions for reference. They are your guide to safe and proper operation of this heater.

Safety information appears throughout these instructions. Pay close attention to them. Below are definitions for the safety information listed throughout this manual.

⚠ DANGER Under this heading, installation, operating and maintenance procedures or practices will be found that, if not carefully followed, WILL result in IMMEDIATE serious personal injury or death.

⚠WARNING Under this heading, installation, operating, and maintenance procedures or practices will be found that, if not carefully followed, COULD result in severe personal injury or death.

⚠ CAUTION Under this heading, installation, operating, and maintenance procedures or practices will be found that, if not carefully followed, MAY result in minor personal injury, product or property damage.

IMPORTANT: Not every possible circumstance that might involve a hazard can be anticipated. The warnings in this manual and on tags or decals affixed to the unit are therefore not all-inclusive. If a procedure, work method, or operating technique not specifically recommended by Dayton is used, you must make sure it is safe for you and others. You should also ensure that equipment will not be damaged or made unsafe by the operating or maintenance method you choose.

⚠WARNING ***This product contains and/or generates chemicals known to the State of California to cause cancer or birth defects, or other reproductive harm.***

⚠ DANGER ***Carbon monoxide poisoning may lead to death! Some people are more affected by carbon monoxide than others. Early signs of carbon monoxide poisoning resemble the flu, with headaches, dizziness, and/or nausea. If you have these signs, the heater may not be operating properly or the areas may not be sufficiently ventilated. Get fresh air at once! Have heater serviced.***

Propane Gas: Propane gas is odorless. An odor-making agent is added to propane gas. The odor helps you detect a propane gas leak. However, the odor added to propane gas can fade. Propane gas may be present even though no odor exists.

⚠WARNING

- ***Install and use heater with care. Follow all local ordinances and codes. In the absence of local ordinances and codes, refer to the Standard for Storage and Handling of Liquefied Petroleum Gas, ANSI/ NFPA 58 and the Natural Gas Installation Code, CAN/CGA B149.2. This instructs on the safe storage and handling of propane gases.***
- ***This product has been approved for use in the Commonwealth of Massachusetts.***
- ***Use only the hose and factory preset regulator provided with the heater.***
- ***Use only propane gas set up for vapor withdrawal.***
- ***Provide adequate ventilation. Before using heater, provide at least a 2.5-square-foot opening of fresh, outside air.***
- ***For indoor use only. Do not use heater outdoors.***
- ***Do not use heater in occupied dwellings or in living or sleeping quarters.***
- ***Do not use heater in basement or below ground level. Propane gas is heavier than air. If a leak occurs, propane gas may sink to the lowest possible level and may accumulate to explosive concentrations.***
- ***Keep appliance area clear and free from combustible materials, gasoline, paint thinner, and other flammable vapors and liquids. Dust is combustible. Do not use heater in areas with high dust content.***
- ***Minimum heater clearances from combustibles: Sides: 3 feet, Top: 6 feet.***
- ***Keep heater at least six feet from propane tank(s).***
- ***Keep propane tank(s) below 100° F.***
- ***Check heater for damage before each use. Do not use a damaged heater.***
- ***Check hose before each use of heater. If highly worn or cut, replace with hose specified by manufacturer.***
- ***Locate heater on stable and level surface if heater is hot or operating.***
- ***Not intended for use on finished floors.***
- ***Never block air inlet (bottom of shell) or air outlet (around top of shell) of heater.***
- ***Keep heater away from strong drafts, wind, water spray, rain, or dripping water.***
- ***Never operate heater while unattended.***
- ***Keep children and animals away from heater.***
- ***Never move, handle, or service a hot or operating heater. Severe burns may result. You must wait 15 minutes after turning heater off.***
- ***To prevent injury, wear gloves when handling heater.***

Model 3VH22

General Safety Information (Continued)

- ***Never attach duct work to heater.***
- ***Do not alter heater. Keep heater in its original state.***
- ***Do not use heater if altered.***
- ***Turn off propane supply to heater when not in use.***
- ***Use only original replacement parts. This heater must use design-specific parts. Do not substitute or use generic parts. Improper replacement parts could cause serious or fatal injuries.***

General Specifications

Output Rating .... 40/60/80,000 Btu/Hr
Fuel .... Propane Vapor Only
Fuel Consumption
Gallons/Hr .... Min .44, Max .87
Pounds/Hour .... Min 1.86, Max 3.71
Supply Pressure to Regulator
Maximum .... 200 psi
Minimum, for input adjustment .. 20 psi
Manifold Pressure .... High 23.8 w.c., Low 18 w.c.
Ignitor Gap .... 0.195 Inches
Min. Temperature Surrounding Air ... -20ºF (-29ºC)
Weight - Heater .... 13 pounds
Shipping .... 17 pounds
Size - L x W x H (Inches)
Heater .... 15 x 16 x 20
Carton .... 18 x 18.75 x 20.75

Product Identification

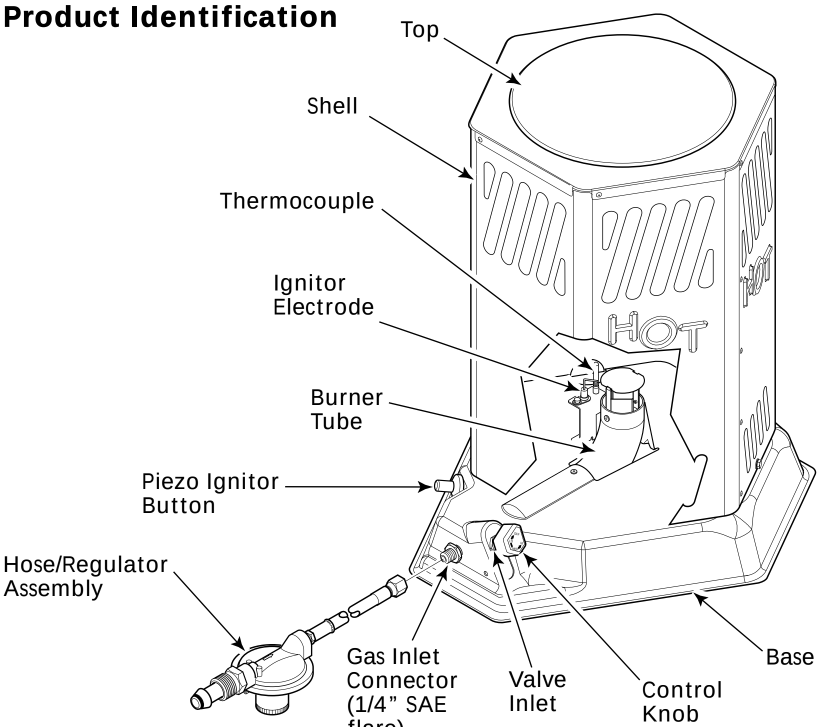


Figure 2 - Product Identification

Theory of Operation

THE FUEL SYSTEM

The hose/regulator assembly attaches to the propane gas supply. This provides fuel to the heater.

THE IGNITION SYSTEM

The piezo ignitor lights the main burner.

THE AUTOMATIC CONTROL SYSTEM

This system causes the heater to shut down if the flame goes out.

Dayton® Propane Construction Convection Heater

Propane Supply

Propane gas and propane tank(s) must be provided by the customer.

Use this heater only with a propane vapor withdrawal supply system. See Chapter 5 of the *Standard for Storage and Handling of Liquefied Petroleum Gas, ANSI/NFPA 58 and/or CAN/CGA B149.2.* Your local library or fire department will have this booklet.

This heater will operate with a 20-pound propane tank. However, you can only operate it in the LOW position during mildly cool weather. At higher heat settings or during colder weather, you must use larger tanks.

The amount of propane gas ready for use from propane tanks varies. Two factors determine this amount.

1. The amount of propane gas in tank(s)
2. The temperature of tank(s)

The chart below shows the minimum number of 100-pound tanks needed to run the heater. Connect tanks together with a manifold (available from propane supplier.

Average Temperature (°F) at Tank Location	Number of Tanks (100-lbs)
60°	1
40°	1
32°	1
20°	1
10°	2
0°	2

Less gas is vaporized at lower temperatures. Your local propane gas dealer will help you select the proper supply system.

Ventilation

⚠WARNING ***Provide at least a 2.5-square-foot opening of fresh, outside air while running heater. If proper fresh, outside air ventilation is not provided, carbon monoxide poisoning can occur. Provide proper fresh, outside air ventilation before running heater.***

Installation

⚠WARNING ***Review and understand the warnings in the General Safety Information section. They are needed to safely operate this heater. Follow all local codes when using this heater.***

⚠WARNING ***Test all gas piping and connections for leaks after installation or servicing. Never use an open flame to check for a leak. Apply a mixture of liquid soap and water to all joints. Bubbles forming show a leak. Correct all leaks at once.***

1. Provide propane supply system (See *Propane Supply*).
2. Connect fuel gas fitting on hose/ regulator assembly to propane tank(s). Turn fuel gas fitting counterclockwise into threads on tank. Tighten firmly using a wrench.

IMPORTANT: Tighten regulator with vent pointing down. Pointing vent down protects regulator from weather damage.

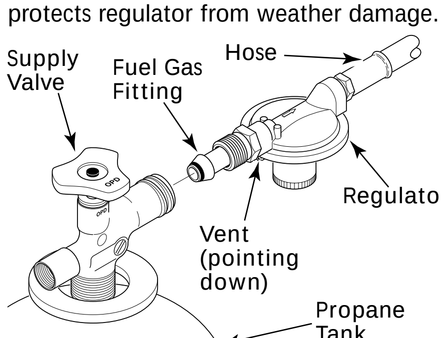


Figure 3 - Regulator with Vent Pointing Down

3. Connect hose to the valve inlet. Tighten firmly using a wrench. You must use the regulator supplied with heater even if propane tank has one.

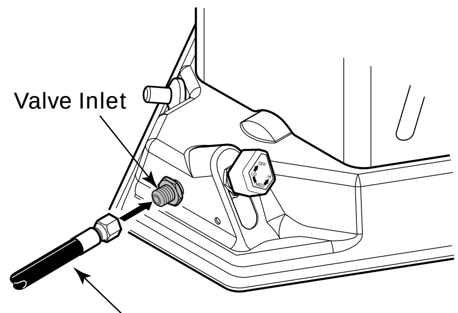


Figure 4 - Hose and Valve Inlet

4. Open propane supply valve on propane tank(s) slowly.

NOTE: If not opened slowly, excess-flow check valve on propane tank may stop gas flow. If this happens, you may hear a click inside the regulator assembly. This is the check valve closing. To reset the excess-flow check valve, close propane supply valve and open it again slowly.

5. Check all connections for leaks.
6. Close propane supply valve.

Model 3VH22

Operation

⚠WARNING ***Review and understand the warnings in the General Safety Information Section. They are needed to safely operate this heater. Follow all local codes when using this heater.***

TO START HEATER

1. Follow all installation, ventilation, and safety information.
2. Locate heater on stable and level surface. Make sure strong drafts do not blow on heater.
3. Make sure unit is turned off by lightly depressing and turning control knob fully clockwise to OFF.
4. Open propane supply valve on propane tank(s) slowly.

NOTE: If not opened slowly, excess-flow check valve on propane tank may stop gas flow. If this happens, you may hear a click inside the regulator assembly. This is the check valve closing. To reset the excess flow check valve, close propane supply valve and open it again slowly.

5. Slightly depress and turn control knob counterclockwise to the low position (See Figure 5).
6. With the control knob pushed all the way in, press and release the piezo ignitor button. Keep pressing ignitor button until the burner lights. Hold control knob down for a maximum of 15 seconds while attempting ignition. If heater does not ignite, release control knob and wait 3 minutes before attempting reignition.

NOTE: Keep hands and face away from outlet (around top of shell) of heater while attempting to start heater.

7. After ignition, hold control knob down for approximately 30 seconds. This activates the automatic control system.
8. When burner remains lit, set heater at the desired heat level by slightly depressing the control knob and turning counterclockwise to the Medium or High settings (see Figure 5).
9. If burner goes out, turn off gas. Slightly depress and turn control knob fully clockwise to OFF. Check fuel supply. If adequate fuel is available, restart heater beginning at Step #1.

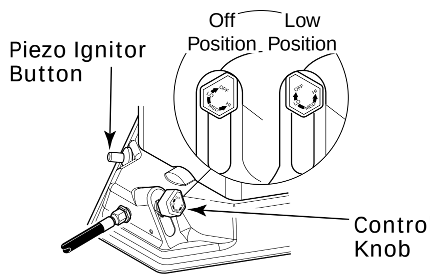


Figure 5 - Control Knob, and Piezo Ignitor Button Locations

Correct Flame Pattern

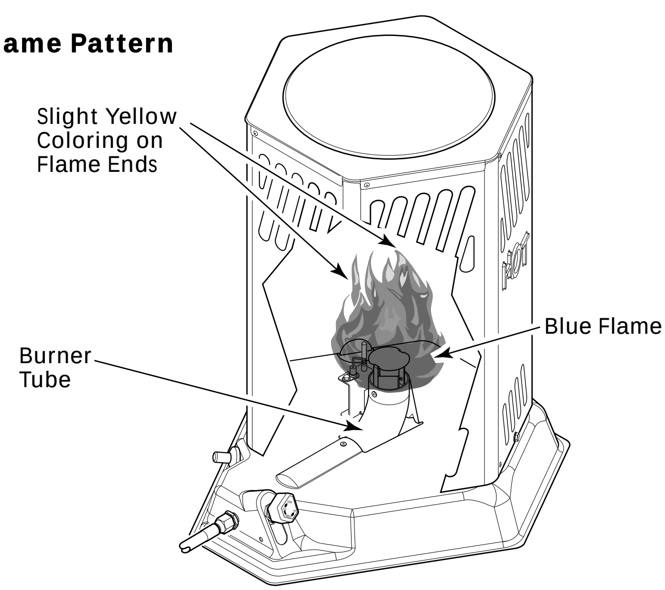


Figure 6 - Normal Flame Pattern at High Position

FLAME PATTERNS

Figure 6 shows a correct flame pattern. The burner flame is mostly blue with a slight yellow coloring on the ends.

Figure 7 shows an incorrect flame pattern. The flame is mostly yellow. The incorrect flame pattern results from low gas pressure or from flashback.

⚠WARNING ***Running heater below specified input rating may cause flashback. During flashback, the burner flame is mostly yellow. The flame will burn inside the burner tube, causing a roaring noise. If flashback occurs, turn heater off. After burner tube cools, restart the heater.***

Dayton® Propane Construction Convection Heater

Incorrect Flame Pattern– Flashback

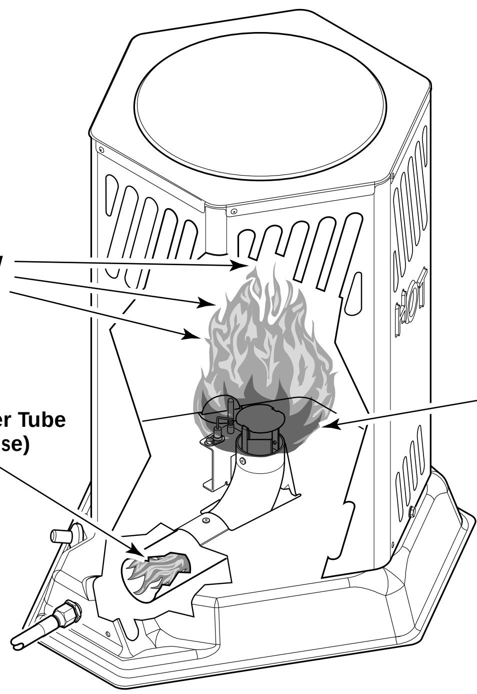


Figure 7 - Flame Pattern during Flashback

TO STOP HEATER

1. Tightly close propane supply valve on propane tank(s). Allow heater to burn remaining fuel in hose.
2. Shut off main burner valve. Do this by pushing in the control knob and turning it clockwise to the OFF position.

TO RESTART HEATER

1. Wait five minutes after stopping heater.
2. Restart heater by following steps under *To Start Heater,* page 5.

Storage

⚠ CAUTION ***Disconnect heater from propane supply tank(s).***

1. Store propane tank(s) in safe manner. Refer to Chapter 5 of *Standard for Storage and Handling of Liquefied Petroleum Gases, ANSI/NFPA 58 and/or CAN/CGA B149.2.* Follow all local codes. Always store propane tanks outdoors.
2. Place plastic cover caps over brass fittings on inlet connector and hose/regulator assembly.
3. Store in a dry, clean, and safe place.

Maintenance

⚠WARNING ***Never attempt to service heater while it is connected to propane supply, operating, or hot. Severe burns can occur.***

1. Keep heater clean.
2. Inspect heater before each use. Check connections for leaks. Apply mixture of liquid soap and water to connections. Bubbles forming show a leak that must be corrected. Correct all leaks at once.
3. Inspect hose/regulator assembly before each use. If hose is highly worn or cut, replace.
4. Have heater inspected yearly by a qualified service person.

Model 3VH22

Troubleshooting Chart

⚠WARNING ***Never attempt to service heater while it is connected to propane supply, operating, or hot. Severe burns can occur.***

Symptom	Possible Cause(s)	Corrective Action
Burner fails to light	1. Propane supply valve closed on propane tank(s) 2. Excess flow check valve closed 3. Blockage in burner orifice 4. Piezo ignition system not sparking	1. Open propane supply valve slowly 2. Close propane supply valve on propane tank and reopen slowly 3. Replace burner orifice 4. Assure ignitor electrode gap is .195". Check wire lead for damage. Replace piezo ignitor and/or ignitor electrode as necessary
Burner lights but goes out when automatic control valve button is released	1. Not enough warm-up time 2. Low gas pressure 3. Thermocouple loose or needs to be replaced 4. Automatic control valve needs to be replaced	1. Relight, hold automatic control valve button in 45 seconds 2. Check propane tank(s) for proper gas supply 3. Tighten connection or replace thermocouple 4. Replace automatic control valve
Burn rate is low	1. Burner control is on Low 2. Plugged gas orifice 3. Low gas pressure 4. Low fuel supply	1. Slightly depress control knob and rotate counterclockwise to the Medium or High position 2. Replace gas orifice 3. Check gas supply; check regulator output 4. Consult propane gas supplier

For Repair Parts, call 1-800-323-0620

24 hours a day - 365 days a year

Please provide following information:
-Model number
-Serial number (if any)
-Part description and number as shown in parts list

Address parts correspondence to:
Grainger Parts
P.O. Box 3074
1657 Shermer Road
Northbrook, IL 60065-3074 U.S.A.

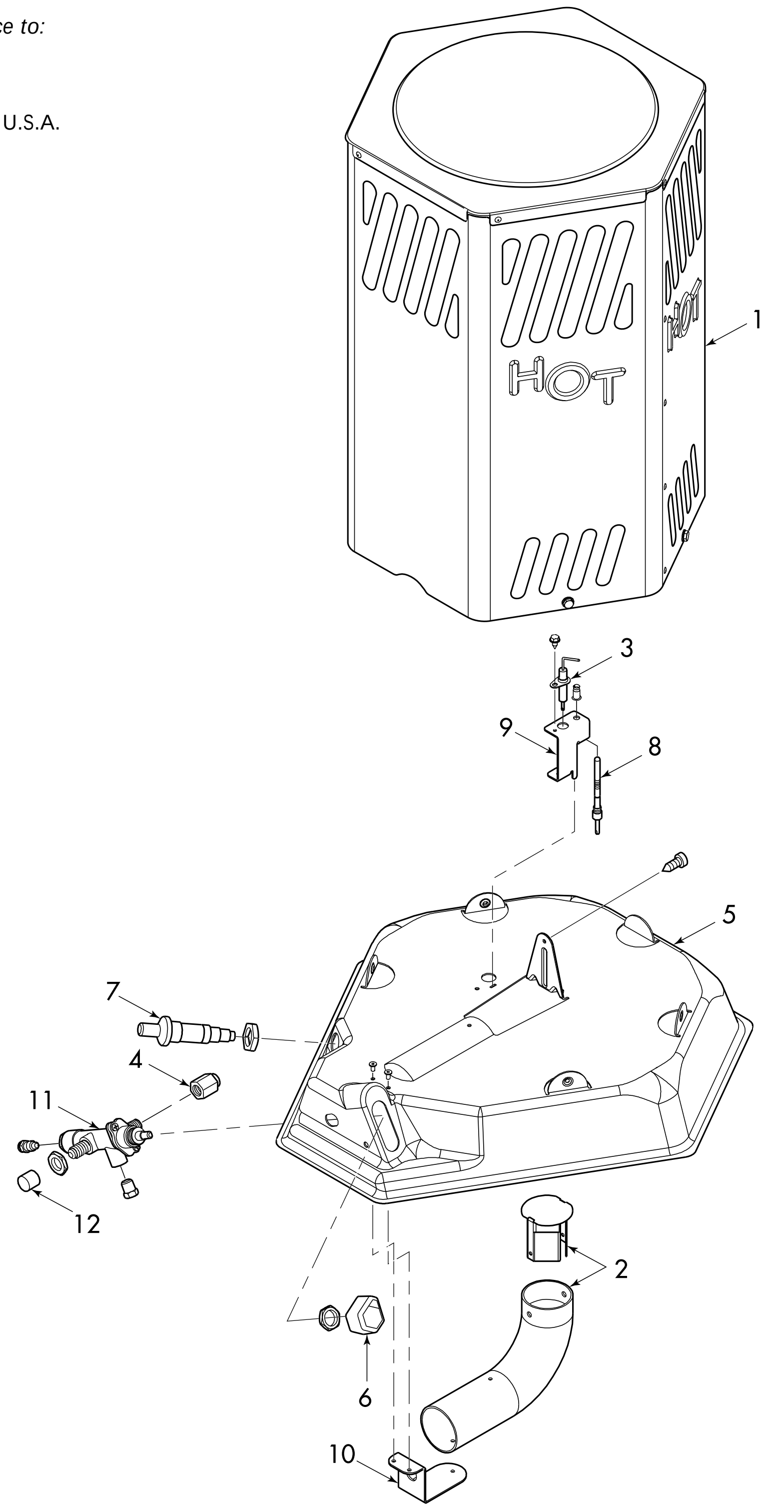


Figure 8 - Repair Parts Illustration

Repair Parts List

⚠WARNING ***Use only original repair parts. This heater must use design-specific parts. Do not substitute or use generic parts. Improper repair parts could cause serious or fatal injuries. This will also protect your warranty coverage for parts replaced under warranty.***

Reference Number	Description	Part No.	Quantity
1	Top and Shell Assembly	**	1
2	Burner Assembly	103929-01	1
3	Ignitor Electrode	103904-01	1
4	Nozzle	103032-01	1
5	Base	103031-01	1
6	Stealth Knob	103036-01	1
7	Piezo Ignitor	102445-01	1
8	Thermocouple Kit	099236-01	1
9	Thermocouple Bracket	103854-01	1
10	Nozzle Locator	103037-01	1
11	Valve Assembly	103930-01	1
12	Cap Sleeve	078978-03	1
/\	Tradename Decal (3VH22)	099154-04	1
/\	Information Decal	099681-04	1
/\	Operation Decal	099683-02	1
/\	Regulator & Hose Assembly	LPA3110	1
†	Regulator	LPA2160	1
†	POL Connector	LPA4020	1
†	*10' Hose	LPA1000	1

(/\) Not shown.
(†) Accessories.
(*) Total hose length should not exceed 20 feet from tank/cylinder.
(**) Not a field replaceable part.

Dayton® Propane Construction Convection Heater

LIMITED WARRANTY

DAYTON ONE-YEAR LIMITED WARRANTY. *Dayton propane construction heater, Models covered in this manual, are warranted by Dayton Electric Mfg. Co. (Dayton) to the original user against defects in workmanship or materials under normal use for one year after date of purchase. Any part which is determined to be defective in material or workmanship and returned to an authorized service location, as Dayton designates, shipping costs prepaid, will be, as the exclusive remedy, repaired or replaced at Dayton's option. For limited warranty claim procedures, see PROMPT DISPOSITION below. This limited warranty gives purchasers specific legal rights which vary from jurisdiction to jurisdiction.*

LIMITATION OF LIABILITY. *To the extent allowable under applicable law, Dayton's liability for consequential and incidental damages is expressly disclaimed. Dayton's liability in all events is limited to, and shall not exceed, the purchase price paid.*

WARRANTY DISCLAIMER. *Dayton has made a diligent effort to provide product information and illustrate the product in this literature accurately; however, such information and illustrations are for the sole purpose of identification, and do not express or imply a warranty that the products are MERCHANTABLE, or FIT FOR A PARTICULAR PURPOSE, or that the products will necessarily conform to the illustrations or descriptions. Except as provided below, no warranty or affirmation of fact, expressed or implied, other than as stated in "LIMITED WARRANTY" above is made or authorized by Dayton.*

PRODUCT SUITABILITY. *Many jurisdictions have codes and regulations governing sales, construction, installation, and/or use of products for certain purposes, which may vary from those in neighboring areas. While Dayton attempts to assure that its products comply with such codes, it cannot guarantee compliance, and cannot be responsible for how the product is installed or used. Before purchase and use of a product, review the product applications, and all applicable national and local codes and regulations, and be sure that the product, installation, and use will comply with them.*

Certain aspects of disclaimers are not applicable to consumer products; e.g., (a) some jurisdictions do not allow the exclusion or limitation of incidental or consequential damages, so the above limitation or exclusion may not apply to you; (b) also, some jurisdictions do not allow limitations on how long an implied warranty lasts, consequently the above limitation may not apply to you; and (c) by law, during the period of this Limited Warranty, any implied warranties of implied merchantability or fitness for a particular purpose applicable to consumer products purchased by consumers, may not be excluded or otherwise disclaimed.

PROMPT DISPOSITION. *Dayton will make a good faith effort for prompt correction or other adjustment with respect to any product which proves to be defective within limited warranty. For any product believed to be defective within limited warranty, first write or call dealer from whom product was purchased. Dealer will give additional directions. If unable to resolve satisfactorily, write to Dayton at address below, giving dealer's name, address, date and number of dealer's invoice, and describing the nature of the defect. Title and risk of loss pass to buyer on delivery to common carrier. If product was damaged in transit to you, file claim with carrier.*

Manufactured for Dayton Electric Mfg. Co., 5959 W. Howard St., Niles, Illinois 60714 U.S.A.

103918 01

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Niles, Illinois 60714 U.S.A.

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01/03

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